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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/676,338

09/30/2003

Daoqiang Lu

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7151

8791

7590

03/21/2005

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EXAMINER

EVERHART, CARIDAD

ART UNIT

PAPER NUMBER

2829

DATE MAILED: 03/21/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/676,338	<b>Applicant(s)</b> LU, DAOQIANG	
	<b>Examiner</b> Caridad M. Everhart	<b>Art Unit</b> 2825	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |  |
|---|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)            |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date ____ | 6) <input type="checkbox"/> Other: ____  |

***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-4 are recites the limitation "on the substrate" in lines 3 and 5. There is insufficient antecedent basis for this limitation in the claim.

Line 2 recites "a circuit substrate", so that it seems the recitation in lines 3 and 5 should be "on the circuit substrate".

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Seri, et al. (US 6,663,946).

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Seri, et al disclose a multilayer wiring and a method of forming the multilayer wiring which includes a plurality of dielectric layers which alternate an organic dielectric layer and an organic cladding dielectric layer(col. 3, lines 55-62 and col. 4,lines 9-14). The layers are formed on a support which is understood to be the substrate(col. 14, lines 55-65), and a copper pattern is present on the support. There is also a wiring conductor in the multilayer wiring structure(col. 4,lines 25-30). The first organic layer is a polymer layer (col. 9, lines 65-67); the second organic layer is a polymer which comprises a cyanurate (isocyanurate, col. 11, lines 30-39). There is a heating step(col. 12, lines 55-58). With respect to claim 4, if there is a thermal treatment above the thermal decomposition temperature, it would be expected that there would be some volume loss.

Seri, et al is silent with respect to the glass transition temperature and the thermal decomposition temperature and the recited elastic modulus and the residue volume.

With respect to these properties, these are variables of the art which one of ordinary skill in the art would be able to determine. It would have been obvious to one of ordinary skill in the art to obtain the desirable properties of the cyanurate-comprising layer by the combination of the proportion of cyanurate in the layer. Cyanurates are known in the art to decompose at the high temperatures recited in the claims, in that cyanurates are included in fire-retardant compositions in order to make the compositions fire-retardant. In addition, cyanurates are known in the art to have high glass-transition temperatures. With respect to the elastic or Young's modulus, Seri, et

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al disclose that this can be controlled according to the proportion of the components(col. 11, lines 39-5).

Claims 5-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Seri, et al as applied to claim 1 above, and further in view of Carter, et al. (US 6,093,636).

Seri, et al is silent with respect to a step of thermally treating at a temperature greater than the thermal decomposition temperature<sup>A</sup> and circuit devices

Carter, et al discloses forming layers over a substrate which includes circuit devices(col. 3, lines 21-25 and 31-35). The substrate can include an underlayer of insulation(col. 3, lines 35-37), which satisfies the limitation of depositing a first dielectric layer. The second dielectric material comprises polycyanurates(col. 3, lines 52-57). The layer is thermally treated at a temperature higher than the thermal decomposition temperature(col. 21, lines 3-17). It is implied that there can be a further dielectric layer formed, in the disclosure that there will be subsequent processing(col. 22, lines 50-55).

It would have been obvious to one of ordinary skill in the art at the time of the invention that the device and process taught by Seri, et al could be combined with the device and process taught by Carter, et al. in which there are devices in the substrate layer because the polymer layers taught by Seri et al have properties that can protect underlayers which include devices as well as metal circuit lines and because Carter et al teaches their usefulness in a device and process in which devices are included in the substrate layer.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Caridad M. Everhart whose telephone number is 571-272-1892. The examiner can normally be reached on Monday through Fridays 7:30-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, B. Baumeister can be reached on 571-272-1722. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

C. Everhart  
3-16-2005

*C. Everhart*  
CARIDAD M. EVERHART  
PATENT EXAMINER